

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: GAN et al

Art Unit:

Serial No. To Be Assigned

Examiner:

Filed: March 14, 2001

Atty. Docket: CL0001165

For: ISOLATED HUMAN RAS-LIKE  
PROTEINS, NUCLEIC ACID MOLECULES  
ENCODING THESE HUMAN RAS-LIKE  
PROTEINS, AND USES THEREOF

jc929 U.S. PRO  
09/805455  
03/14/01

SUBMISSION OF SEQUENCE LISTING  
UNDER 37 C.F.R. § 1.821(a)

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.C. 20231

Sir:

In compliance with 37 C.F.R. § 1.821(a), applicants submit the Sequence Listing,  
including the paper copy of the Sequence Listing and the computer readable copy of the  
Sequence Listing.

**In the Specification:**

The Sequence Listing is provided on pages 56-72 of the specification in the  
above-identified application.

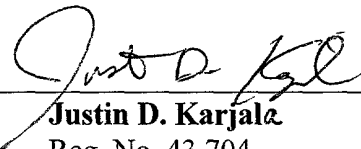
**REMARKS**

In accordance with 37 C.F.R. § 1.821(f), the paper copy of the Sequence Listing and the computer readable copy of the Sequence Listing submitted herewith in the above application are the same.

It is respectfully believed that this application complies with the Sequence Listing requirements and is now in condition for processing.

Respectfully submitted,

CELERA GENOMICS

By:   
**Justin D. Karjala**  
Reg. No. 43,704

Date: March 14, 2001

Celera Genomics Corporation  
45 West Gude Drive, C2-4#20  
Rockville, MD 20850  
Tel: 240-453-3067  
Fax: 240-453-3084

## SEQUENCE LISTING

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PROTEINS, AND USES THEREOF

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&lt;170&gt; FastSEQ for Windows Version 4.0

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actcaactgt ccacattggg tgggtacctg tgtgtgtgtgt gtgtgtgtgt ggggtgtgtc 20580
ttgaagtggc aggtcccaaa tgcttaggca atctgaacct tggaccttgc agagaggaga 20640
gatgtccctg taggtgggag ggacaggag atgcagcagc tggccgggtga ccttttctgc 20700
ccttgatggg caaagctggg ggtagggaaa ggagacaagt gctcatactt acctccctcc 20760
ctgcccaggc tctctgttaa ggtctgagt ctgtctctgt gagccattgc atctgtctgt 20820
ctatgcctg atgcctggat ggacaagggg tgtgtgtgtgt tgtgtgtgtgt tgtgtgtgtgt 20880
agtgtgaggc tgaggaaga ggaacagtgg gggatgggca ggaaagtggg ctgtggggtc 20940
agggagcgca t

```

<210> 4  
 <211> 609  
 <212> PRT  
 <213> Human

<400> 4  
 Met Ala Gly Thr Leu Asp Leu Asp Lys Gly Cys Thr Val Glu Glu Leu  
 1 5 10 15  
 Leu Arg Gly Cys Ile Glu Ala Phe Asp Asp Ser Gly Lys Val Arg Asp

[illegible]

```

Val Ser Tyr Phe Leu Arg Ser Ser Ser Val Leu Gly Gly Arg Met Gly
                485                      490                      495
Phe Val His Asn Phe Gln Glu Ser Asn Ser Leu Arg Pro Val Ala Cys
                500                      505                      510
Arg His Cys Lys Ala Leu Ile Leu Gly Ile Tyr Lys Gln Gly Leu Lys
                515                      520                      525
Cys Arg Ala Cys Gly Val Asn Cys His Lys Gln Cys Lys Asp Arg Leu
                530                      535                      540
Ser Val Glu Cys Arg Arg Arg Ala Gln Ser Val Ser Leu Glu Gly Ser
545                      550                      555                      560
Ala Pro Ser Pro Ser Pro Met His Ser His His His Arg Ala Phe Ser
                565                      570                      575
Phe Ser Leu Pro Arg Pro Gly Arg Arg Gly Ser Arg Pro Pro Glu Ile
                580                      585                      590
Arg Glu Glu Glu Val Gln Thr Val Glu Asp Gly Val Phe Asp Ile His
                595                      600                      605
Leu

```

```

<210> 5
<211> 664
<212> PRT
<213> Human

```

```

<400> 5
Gly Arg Gly Thr Gln Gly Trp Pro Gly Ser Ser Glu Gln His Val Gln
1          5          10          15
Glu Ala Thr Ser Ser Ala Gly Leu His Ser Gly Val Asp Glu Leu Gly
20          25          30
Val Arg Ser Glu Pro Gly Gly Arg Leu Pro Glu Arg Ser Leu Gly Pro
35          40          45
Ala His Pro Ala Pro Ala Ala Met Ala Gly Thr Leu Asp Leu Asp Lys
50          55          60
Gly Cys Thr Val Glu Glu Leu Leu Arg Gly Cys Ile Glu Ala Phe Asp
65          70          75          80
Asp Ser Gly Lys Val Arg Asp Pro Gln Leu Val Arg Met Phe Leu Met
85          90          95
Met His Pro Trp Tyr Ile Pro Ser Ser Gln Leu Ala Ala Lys Leu Leu
100         105         110
His Ile Tyr Gln Gln Ser Arg Lys Asp Asn Ser Asn Ser Leu Gln Val
115         120         125
Lys Thr Cys His Leu Val Arg Tyr Trp Ile Ser Ala Phe Pro Ala Glu
130         135         140
Phe Asp Leu Asn Pro Glu Leu Ala Glu Gln Ile Lys Glu Leu Lys Ala
145         150         155         160
Leu Leu Asp Gln Glu Gly Asn Arg Arg His Ser Ser Leu Ile Asp Ile
165         170         175
Asp Ser Val Pro Thr Tyr Lys Trp Lys Arg Gln Val Thr Gln Arg Asn
180         185         190
Pro Val Gly Gln Lys Lys Arg Lys Met Ser Leu Leu Phe Asp His Leu
195         200         205
Glu Pro Met Glu Leu Ala Glu His Leu Thr Tyr Leu Glu Tyr Arg Ser
210         215         220
Phe Cys Lys Ile Leu Phe Gln Asp Tyr His Ser Phe Val Thr His Gly
225         230         235         240
Cys Thr Val Asp Asn Pro Val Leu Glu Arg Phe Ile Ser Leu Phe Asn

```

```

                245                250                255
Ser Val Ser Gln Trp Val Gln Leu Met Ile Leu Ser Lys Pro Thr Ala
                260                265                270
Pro Gln Arg Ala Leu Val Ile Thr His Phe Val His Val Ala Glu Lys
                275                280                285
Leu Leu Gln Leu Gln Asn Phe Asn Thr Leu Met Ala Val Val Gly Gly
                290                295                300
Leu Ser His Ser Ser Ile Ser Arg Leu Lys Glu Thr His Ser His Val
305                310                315                320
Ser Pro Glu Thr Ile Lys Leu Trp Glu Gly Leu Thr Glu Leu Val Thr
                325                330                335
Ala Thr Gly Asn Tyr Gly Asn Tyr Arg Arg Arg Leu Ala Ala Cys Val
                340                345                350
Gly Phe Arg Phe Pro Ile Leu Gly Val His Leu Lys Asp Leu Val Ala
                355                360                365
Leu Gln Leu Ala Leu Pro Asp Trp Leu Asp Pro Ala Arg Thr Arg Leu
370                375                380
Asn Gly Ala Lys Met Lys Gln Leu Phe Ser Ile Leu Glu Glu Leu Ala
385                390                395                400
Met Val Thr Ser Leu Arg Pro Pro Val Gln Ala Asn Pro Asp Leu Leu
                405                410                415
Ser Leu Leu Thr Val Ser Leu Asp Gln Tyr Gln Thr Glu Asp Glu Leu
                420                425                430
Tyr Gln Leu Ser Leu Gln Arg Glu Pro Arg Ser Lys Ser Ser Pro Thr
                435                440                445
Ser Pro Thr Ser Cys Thr Pro Pro Pro Arg Pro Pro Val Leu Glu Glu
450                455                460
Trp Thr Ser Ala Ala Lys Pro Lys Leu Asp Gln Ala Leu Val Val Glu
465                470                475                480
His Ile Glu Lys Met Val Glu Ser Val Phe Arg Asn Phe Asp Val Asp
                485                490                495
Gly Asp Gly His Ile Ser Gln Glu Glu Phe Gln Ile Ile Arg Gly Asn
500                505                510
Phe Pro Tyr Leu Ser Ala Phe Gly Asp Leu Asp Gln Asn Gln Asp Gly
515                520                525
Cys Ile Ser Arg Glu Glu Met Val Ser Tyr Phe Leu Arg Ser Ser Ser
530                535                540
Val Leu Gly Gly Arg Met Gly Phe Val His Asn Phe Gln Glu Ser Asn
545                550                555                560
Ser Leu Arg Pro Val Ala Cys Arg His Cys Lys Ala Leu Ile Leu Gly
565                570                575
Ile Tyr Lys Gln Gly Leu Lys Cys Arg Ala Cys Gly Val Asn Cys His
580                585                590
Lys Gln Cys Lys Asp Arg Leu Ser Val Glu Cys Arg Arg Arg Ala Gln
595                600                605
Ser Val Ser Leu Glu Gly Ser Ala Pro Ser Pro Ser Pro Met His Ser
610                615                620
His His His Arg Ala Phe Ser Phe Ser Leu Pro Arg Pro Gly Arg Arg
625                630                635                640
Gly Ser Arg Pro Pro Glu Ile Arg Glu Glu Glu Val Gln Thr Val Glu
                645                650                655
Asp Gly Val Phe Asp Ile His Leu
                660

```

&lt;210&gt; 6

&lt;211&gt; 608

&lt;212&gt; PRT

&lt;213&gt; Mus musculus

&lt;400&gt; 6

```

Met Ala Ser Thr Leu Asp Leu Asp Lys Gly Cys Thr Val Glu Glu Leu
 1          5          10          15
Leu Arg Gly Cys Ile Glu Ala Phe Asp Asp Ser Gly Lys Val Arg Asp
          20          25          30
Pro Gln Leu Val Arg Met Phe Leu Met Met His Pro Trp Tyr Ile Pro
          35          40          45
Ser Ser Gln Leu Ala Ser Lys Leu Leu His Phe Tyr Gln Gln Ser Arg
          50          55          60
Lys Asp Asn Ser Asn Ser Leu Gln Val Lys Thr Cys His Leu Val Arg
65          70          75          80
Tyr Trp Val Ser Ala Phe Pro Ala Glu Phe Asp Leu Asn Pro Glu Leu
          85          90          95
Ala Glu Pro Ile Lys Glu Leu Lys Ala Leu Leu Asp Gln Glu Gly Asn
          100          105          110
Arg Arg His Ser Ser Leu Ile Asp Ile Glu Ser Val Pro Thr Tyr Lys
          115          120          125
Trp Lys Arg Gln Val Thr Gln Arg Asn Pro Val Glu Gln Lys Lys Arg
          130          135          140
Lys Met Ser Leu Leu Phe Asp His Leu Glu Pro Met Glu Leu Ala Glu
145          150          155          160
His Leu Thr Tyr Leu Glu Tyr Arg Ser Phe Cys Lys Ile Leu Phe Gln
          165          170          175
Asp Tyr His Ser Phe Val Thr His Gly Cys Thr Val Asp Asn Pro Val
          180          185          190
Leu Glu Arg Phe Ile Ser Leu Phe Asn Ser Val Ser Gln Trp Val Gln
          195          200          205
Leu Met Ile Leu Ser Lys Pro Thr Ala Thr Gln Arg Ala Leu Val Ile
          210          215          220
Thr His Phe Val His Val Ala Glu Lys Leu Leu Gln Leu Gln Asn Phe
225          230          235          240
Asn Thr Leu Met Ala Val Val Gly Gly Leu Ser His Ser Ser Ile Ser
          245          250          255
Arg Leu Lys Glu Thr His Ser His Val Ser Pro Asp Thr Ile Lys Leu
          260          265          270
Trp Glu Gly Leu Thr Glu Leu Val Thr Ala Thr Gly Asn Tyr Ser Asn
          275          280          285
Tyr Arg Arg Arg Leu Ala Ala Cys Val Gly Phe Arg Phe Pro Ile Leu
290          295          300
Gly Val His Leu Lys Asp Leu Val Ala Leu Gln Leu Ala Leu Pro Asp
305          310          315          320
Trp Leu Asp Pro Gly Arg Thr Arg Leu Asn Gly Ala Lys Met Arg Gln
          325          330          335
Leu Phe Ser Ile Leu Glu Glu Leu Ala Met Val Thr Ser Leu Arg Pro
          340          345          350
Pro Val Gln Ala Asn Pro Asp Leu Leu Ser Leu Leu Thr Val Ser Leu
          355          360          365
Asp Gln Tyr Gln Thr Glu Asp Glu Leu Tyr Gln Leu Ser Leu Gln Arg
          370          375          380
Glu Pro Arg Ser Lys Ser Ser Pro Thr Ser Pro Thr Ser Cys Thr Pro
385          390          395          400
Pro Pro Arg Pro Pro Val Leu Glu Glu Trp Thr Ser Val Ala Lys Pro
          405          410          415
Lys Leu Asp Gln Ala Leu Val Ala Glu His Ile Glu Lys Met Val Glu

```

```

          420          425          430
Ser Val Phe Arg Asn Phe Asp Val Asp Gly Asp Gly His Ile Ser Gln
          435          440          445
Glu Glu Phe Gln Ile Ile Arg Gly Asn Phe Pro Tyr Leu Ser Ala Phe
          450          455          460
Gly Asp Leu Asp Gln Asn Gln Asp Gly Cys Ile Ser Arg Glu Glu Met
465          470          475          480
Ile Ser Tyr Phe Leu Arg Ser Ser Ser Val Leu Gly Gly Arg Met Gly
          485          490          495
Phe Val His Asn Phe Gln Glu Ser Asn Ser Leu Arg Pro Val Ala Cys
          500          505          510
Arg His Cys Lys Ala Leu Ile Leu Gly Ile Tyr Lys Gln Gly Leu Lys
          515          520          525
Cys Arg Ala Cys Gly Val Asn Cys His Lys Gln Cys Lys Asp Arg Leu
          530          535          540
Ser Val Glu Cys Arg Arg Arg Ala Gln Ser Val Ser Leu Glu Gly Ser
545          550          555          560
Ala Pro Ser Pro Ser Pro Thr His Thr His His Arg Ala Phe Ser Phe
          565          570          575
Ser Leu Pro Arg Pro Gly Arg Arg Ser Ser Arg Pro Pro Glu Ile Arg
          580          585          590
Glu Glu Glu Val Gln Thr Val Glu Asp Gly Val Phe Asp Ile His Leu
          595          600          605

```

<210> 7  
 <211> 591  
 <212> PRT  
 <213> Human

```

<400> 7
Gly Ser Ser Gly Leu Gly Lys Ala Ala Thr Leu Asp Glu Leu Leu Cys
1          5          10          15
Thr Cys Ile Glu Met Phe Asp Asp Asn Gly Glu Leu Asp Asn Ser Tyr
          20          25          30
Leu Pro Arg Ile Val Leu Leu Met His Arg Trp Tyr Leu Ser Ser Thr
          35          40          45
Glu Leu Ala Glu Lys Leu Leu Cys Met Tyr Arg Asn Ala Thr Gly Glu
          50          55          60
Ser Cys Asn Glu Phe Arg Leu Lys Ile Cys Tyr Phe Met Arg Tyr Trp
65          70          75          80
Ile Leu Lys Phe Pro Ala Glu Phe Asn Leu Asp Leu Gly Leu Ile Arg
          85          90          95
Met Thr Glu Glu Phe Arg Glu Val Ala Ser Gln Leu Gly Tyr Glu Lys
          100          105          110
His Val Ser Leu Ile Asp Ile Ser Ser Ile Pro Ser Tyr Asp Trp Met
          115          120          125
Arg Arg Val Thr Gln Arg Lys Lys Val Ser Lys Lys Gly Lys Ala Cys
          130          135          140
Leu Leu Phe Asp His Leu Glu Pro Ile Glu Leu Ala Glu His Leu Thr
145          150          155          160
Phe Leu Glu His Lys Ser Phe Arg Arg Ile Ser Phe Thr Asp Tyr Gln
          165          170          175
Ser Tyr Val Ile His Gly Cys Leu Glu Asn Asn Pro Thr Leu Glu Arg
          180          185          190
Ser Ile Ala Leu Phe Asn Gly Ile Ser Lys Trp Val Gln Leu Met Val
          195          200          205

```



```

Leu Ser Lys Pro Thr Pro Gln Gln Arg Ala Glu Val Ile Thr Lys Phe
  210                215                220
Ile Asn Val Ala Lys Lys Leu Leu Gln Leu Lys Asn Phe Asn Thr Leu
  225                230                235                240
Met Ala Val Val Gly Gly Leu Ser His Ser Ser Ile Ser Arg Leu Lys
                245                250                255
Glu Thr His Ser His Leu Ser Ser Glu Val Thr Lys Asn Trp Asn Glu
                260                265                270
Met Thr Glu Leu Val Ser Ser Asn Gly Asn Tyr Cys Asn Tyr Arg Lys
                275                280                285
Ala Phe Ala Asp Cys Asp Gly Phe Lys Ile Pro Ile Leu Gly Val His
  290                295                300
Leu Lys Asp Leu Ile Ala Val His Val Ile Phe Pro Asp Trp Thr Glu
  305                310                315                320
Glu Asn Lys Val Asn Ile Val Lys Met His Gln Leu Ser Val Thr Leu
                325                330                335
Ser Glu Leu Val Ser Leu Gln Asn Ala Ser His His Leu Glu Pro Asn
                340                345                350
Met Asp Leu Ile Asn Leu Leu Thr Leu Ser Leu Asp Leu Tyr His Thr
                355                360                365
Glu Asp Asp Ile Tyr Lys Leu Ser Leu Val Leu Glu Pro Arg Asn Ser
  370                375                380
Lys Ser Pro Thr Ser Pro Thr Thr Pro Asn Lys Pro Val Val Pro Leu
  385                390                395                400
Glu Trp Ala Leu Gly Val Met Pro Lys Pro Asp Pro Thr Val Ile Asn
                405                410                415
Lys His Ile Arg Lys Leu Val Glu Ser Val Phe Arg Asn Tyr Asp His
                420                425                430
Asp His Asp Gly Tyr Ile Ser Gln Glu Asp Phe Glu Ser Ile Ala Ala
  435                440                445
Asn Phe Pro Phe Leu Asp Ser Phe Cys Val Leu Asp Lys Asp Gln Asp
  450                455                460
Gly Leu Ile Ser Lys Asp Glu Met Met Ala Tyr Phe Leu Arg Ala Lys
  465                470                475                480
Ser Gln Leu His Cys Lys Met Gly Pro Gly Phe Ile His Asn Phe Gln
                485                490                495
Glu Met Thr Tyr Leu Lys Pro Thr Phe Cys Glu His Cys Ala Gly Phe
                500                505                510
Leu Trp Gly Ile Ile Lys Gln Gly Tyr Lys Cys Lys Asp Cys Gly Ala
  515                520                525
Asn Cys His Lys Gln Cys Lys Asp Leu Leu Val Leu Ala Cys Arg Arg
  530                535                540
Phe Ala Arg Ala Pro Ser Leu Ser Ser Gly His Gly Ser Leu Pro Gly
  545                550                555                560
Ser Pro Ser Leu Pro Pro Ala Gln Asp Glu Val Phe Glu Phe Pro Gly
                565                570                575
Val Thr Ala Gly His Arg Asp Leu Asp Ser Arg Ala Ile Thr Leu
                580                585                590

```

&lt;210&gt; 8

&lt;211&gt; 581

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 8

Gly Ser Arg Ala Gly Pro Lys Gly Arg Leu Glu Ala Lys Ser Thr Asn

```

1           5           10           15
Ser Pro Leu Pro Ala Gln Pro Ser Leu Ala Gln Ile Thr Gln Phe Arg
20           25           30
Met Met Val Ser Leu Gly His Leu Ala Lys Gly Ala Ser Leu Asp Asp
35           40           45
Leu Ile Asp Ser Cys Ile Gln Ser Phe Asp Ala Asp Gly Asn Leu Cys
50           55           60
Arg Ser Asn Gln Leu Leu Gln Val Met Leu Thr Met His Arg Ile Ile
65           70           75           80
Ile Ser Ser Ala Glu Leu Leu Gln Lys Leu Met Asn Leu Tyr Lys Asp
85           90           95
Ala Leu Glu Lys Asn Ser Pro Gly Ile Cys Leu Lys Ile Cys Tyr Phe
100          105          110
Val Arg Tyr Trp Ile Thr Glu Phe Trp Ile Met Phe Lys Met Asp Ala
115          120          125
Ser Leu Thr Ser Thr Met Glu Phe Gln Asp Leu Val Lys Ala Asn
130          135          140
Gly Glu Glu Ser His Cys His Leu Ile Asp Thr Thr Gln Ile Asn Ser
145          150          155          160
Arg Asp Trp Ser Arg Lys Leu Thr Gln Arg Ile Lys Ser Asn Thr Ser
165          170          175
Lys Lys Arg Lys Val Ser Leu Leu Phe Asp His Leu Glu Pro Glu Glu
180          185          190
Leu Ser Glu His Leu Thr Tyr Leu Glu Phe Lys Ser Phe Arg Arg Ile
195          200          205
Ser Phe Ser Asp Tyr Gln Asn Tyr Leu Val Asn Ser Cys Val Lys Glu
210          215          220
Asn Pro Thr Met Glu Arg Ser Ile Ala Leu Cys Asn Gly Ile Ser Gln
225          230          235          240
Trp Val Gln Leu Met Val Leu Ser Arg Pro Thr Pro Gln Leu Arg Ala
245          250          255
Glu Val Phe Ile Lys Phe Ile His Val Ala Gln Lys Leu His Gln Leu
260          265          270
Gln Asn Phe Asn Thr Leu Met Ala Val Ile Gly Gly Leu Cys His Ser
275          280          285
Ser Ile Ser Arg Leu Lys Glu Thr Ser Ser His Val Pro His Glu Ile
290          295          300
Asn Lys Val Leu Gly Glu Met Thr Glu Leu Leu Ser Ser Cys Arg Asn
305          310          315          320
Tyr Asp Asn Tyr Arg Arg Ala Tyr Gly Glu Cys Thr His Phe Lys Ile
325          330          335
Pro Ile Leu Gly Val His Leu Lys Asp Leu Ile Ser Leu Tyr Glu Ala
340          345          350
Met Pro Asp Tyr Leu Glu Asp Gly Lys Val Asn Val Gln Lys Leu Leu
355          360          365
Ala Leu Tyr Asn His Ile Asn Glu Leu Val Gln Leu Gln Asp Val Ala
370          375          380
Pro Pro Leu Asp Ala Asn Lys Asp Leu Val His Leu Leu Thr Leu Ser
385          390          395          400
Leu Asp Leu Tyr Tyr Thr Glu Asp Glu Ile Tyr Glu Leu Ser Tyr Ala
405          410          415
Arg Glu Pro Arg Asn His Arg Ala Pro Pro Leu Thr Pro Ser Lys Pro
420          425          430
Pro Val Val Val Asp Trp Ala Ser Gly Val Ser Pro Lys Pro Asp Pro
435          440          445
Lys Thr Ile Ser Lys His Val Gln Arg Met Val Asp Ser Val Phe Lys
450          455          460

```

Asn	Tyr	Asp	Leu	Asp	Gln	Asp	Gly	Tyr	Ile	Ser	Gln	Glu	Glu	Phe	Glu
465					470					475					480
Lys	Ile	Ala	Ala	Ser	Phe	Pro	Phe	Ser	Phe	Cys	Val	Met	Asp	Lys	Asp
				485					490					495	
Arg	Glu	Gly	Leu	Ile	Ser	Arg	Asp	Glu	Ile	Thr	Ala	Tyr	Phe	Met	Arg
			500					505					510		
Ala	Ser	Ser	Ile	Tyr	Ser	Lys	Leu	Gly	Leu	Gly	Phe	Pro	His	Asn	Phe
		515					520					525			
Gln	Glu	Thr	Thr	Tyr	Leu	Lys	Pro	Thr	Phe	Cys	Asp	Asn	Cys	Ala	Gly
	530					535					540				
Phe	Leu	Trp	Gly	Val	Ile	Lys	Gln	Gly	Tyr	Arg	Cys	Lys	Asp	Cys	Gly
545					550				555						560
Met	Asn	Cys	His	Lys	Gln	Cys	Lys	Asp	Leu	Val	Val	Phe	Glu	Cys	Lys
				565					570					575	
Lys	Arg	Ser	Lys	Ser											
			580												